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## Pixel Perfect?

Apple's New iPad Goes **High-Res**

**Acer's Iconia  
Tab A200**

**Wacom's  
Intuos5 Touch**

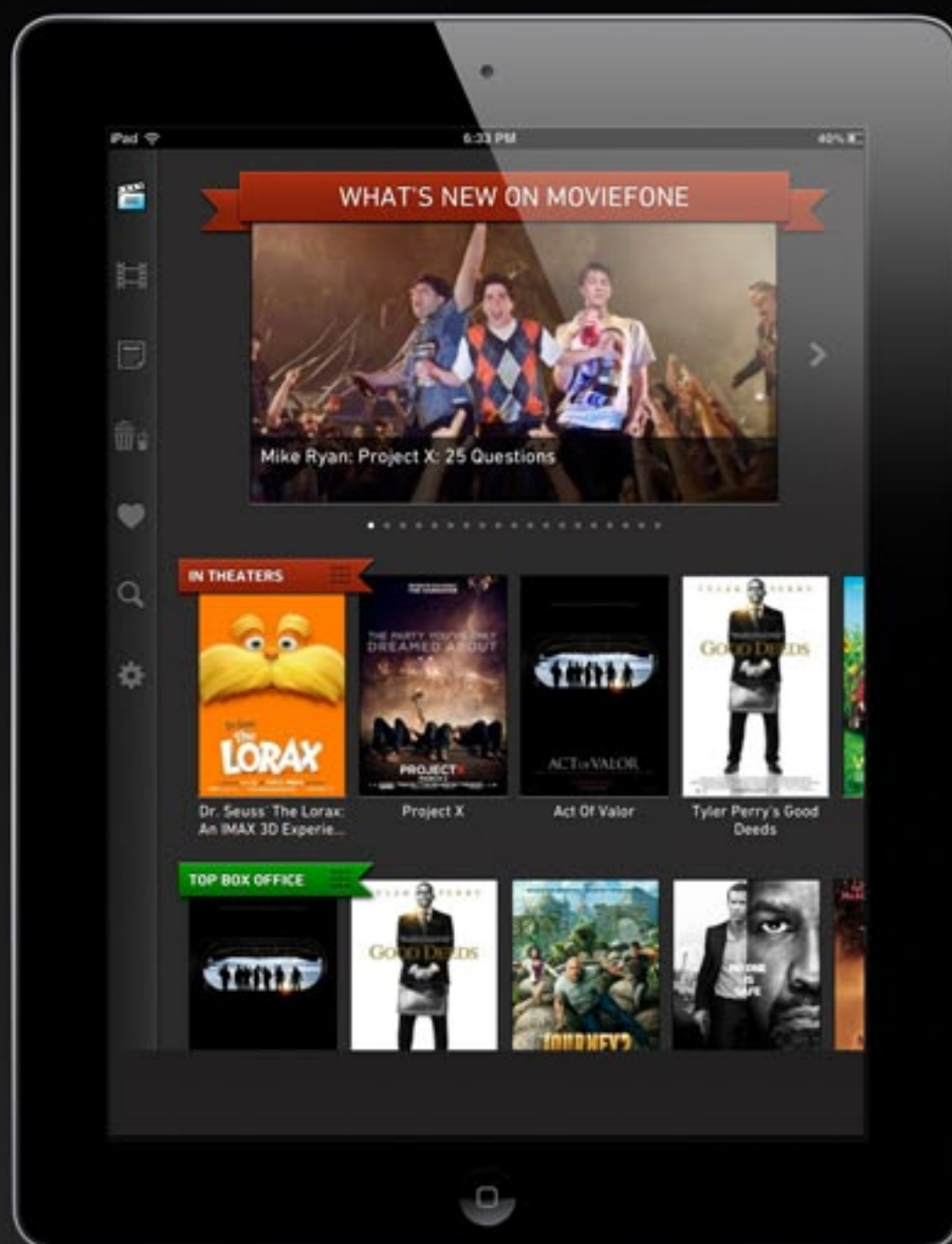
**Samsung's  
Rugby Smart**

**Q&A with Tekzilla's  
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# DISTRO Issue #33...



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iPad

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# Warmgate Cools Down, Galaxy S III Heats Up

*Editor's Letter*

**It's been one week since the launch of the new iPad, but that hasn't stopped it from dominating the news for yet another cycle of Distro — though not for entirely positive reasons. Almost everyone is loving the new display, but not everyone is loving the warmth of the thing. Testing has shown the new iPad runs up to 10 degrees warmer than before, a figure that can conclusively be called “inconsequential.”**

That hasn't stopped furious internetizens from declaring “heatgate.” Yes, the new iPad gets warmer than before, but it's still far cooler than your average, overtaxed laptop when working atop its name-sake environment.

There is, however, one unexpected concern that potential customers should be aware of: charge times. The new iPad has a battery pack close to twice as electron-rich as its predecessor's. That means battery life is maintained despite the power-hungry screen and LTE radios, but it also means topping the thing back off again takes ages. Users can expect full recharge times upwards of eight hours, maybe more. That's probably a sign the next generation of new



tablets will be drawing a little more current when recharging.

The best news on the new iPad this week? The release of *Angry Birds Space* (which has also hit many other platforms). That's only just released as we go to press so you'll have to settle for some very abbreviated impressions from yours truly, but it is

safe to say this is a buck or three well spent. The addition of multiple gravitational fields, plus the freezing effects of a complete vacuum, add a lot of spice to a basic gameplay mechanic that somehow still tastes fresh after all these years.

*Angry Birds* is just one of roughly one zillion iPad apps that were updated this week to support the new Retina display, including Netflix (though movies themselves are still in SD). In case you're wondering, a high-res version of Distro has been completed but as of now is still awaiting approval. The app review folks in Cupertino quite understandably have their hands full at the moment.


Heading to the other side of the world, we've been hearing a huge amount of buzz about the Samsung Galaxy S III of late, the successor to one of the greatest (and most popular) Android devices of all time. At one point it was expected at Mobile World Congress, but the latest indications from an execu-

tive at the company's Chinese division are that the phone could still arrive as early as April. Why, that's only a few weeks away.


Leading up to this, we've seen supposed leaked photo after leaked photo of slinky handsets that are supposed to be the GS III. Our expert crew of photo analysts (headed by Richard Lai) haven't been satisfied that any of these images are authentic, so we're just going to have to wait and see what the thing actually looks like.

That's not the only phone we'll be seeing next month. Sprint has invited us to the unveiling of a new "collaboration" with HTC in New York City on April 4th and, while neither company has told us just what fruits of that partnership will be unveiled, we're quite confident it will be HTC's 4.7-inch 720p One X handset. Rumors are it'll be renamed "Jet" for American consumers, which sounds like exactly the kind of vaguely aggressive and yet totally meaningless moniker these companies love.

The shedding of employees continues at Nokia, with another 1,000 manufacturing jobs to be phased out throughout the course of the year. These are mostly headed to Asian manufacturing plants, but more losses are said to come. It remains to



**What do you get  
the company  
that has \$100  
billion in cash?  
A little more  
independence,  
apparently.**




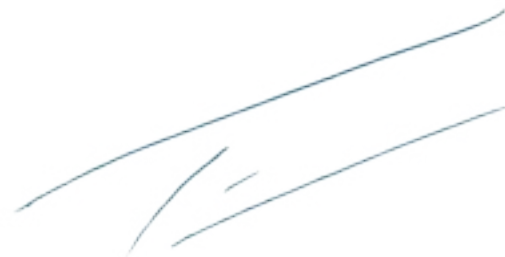
be seen when the bleeding will stop, but the forthcoming release of the Lumia 900 in the United States might help.

Things are naturally in much better shape for Apple, which has a war chest full of so much cash investors were actually worried that the company didn't know what to do with it all. This week the company made things clear, including a \$2.65-per-share quarterly dividend and a \$10 billion buy-back program. What do you get the company that has \$100 billion in cash? A little more independence, apparently.

Finally, the FAA has pledged to take a "fresh look" at its rules for in-air gadget usage, perhaps ending the scourge of the

Terrible 10,000 Feet I wrote about earlier. It's unclear what exactly is in store, but current regulations requiring each and every gadget be tested in each and every aircraft in service must be changed before we can get anywhere.

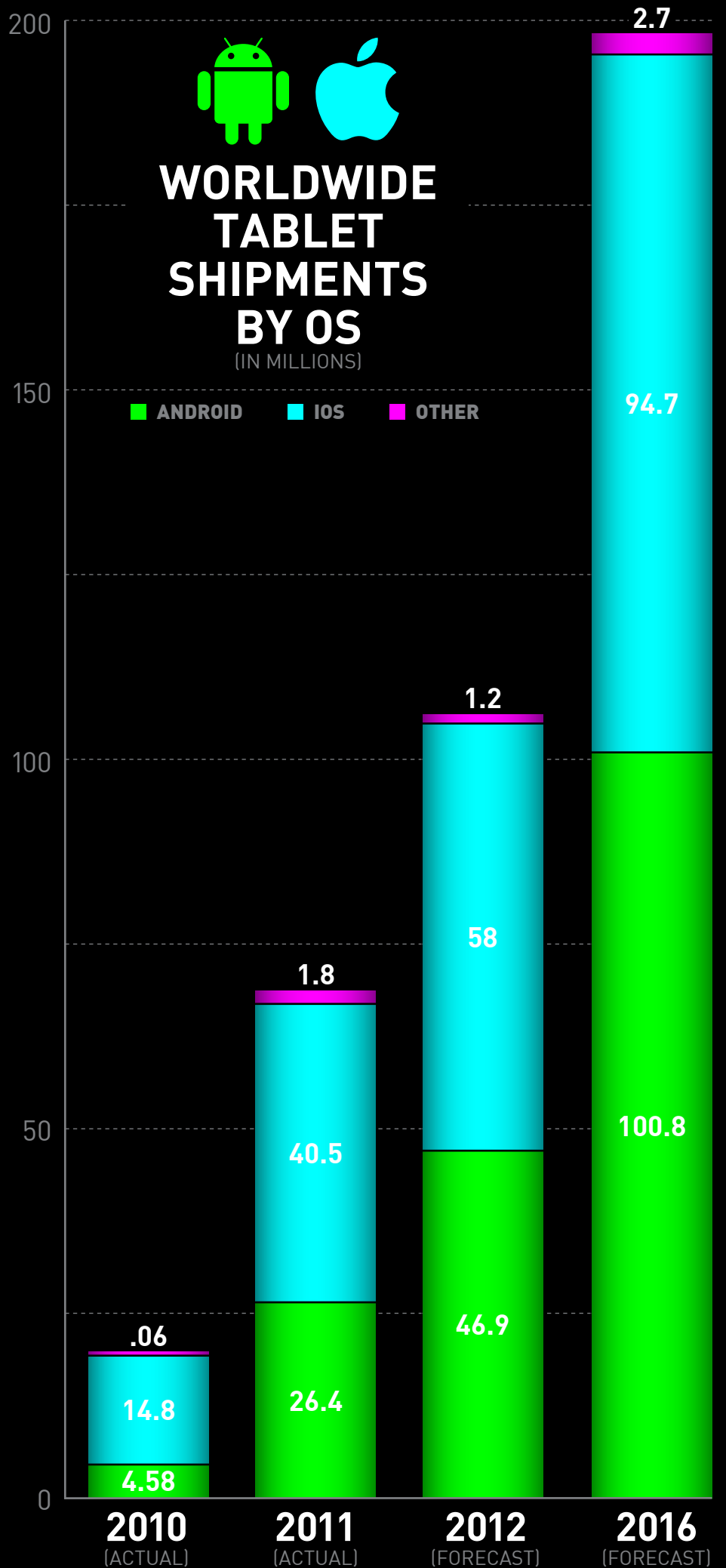
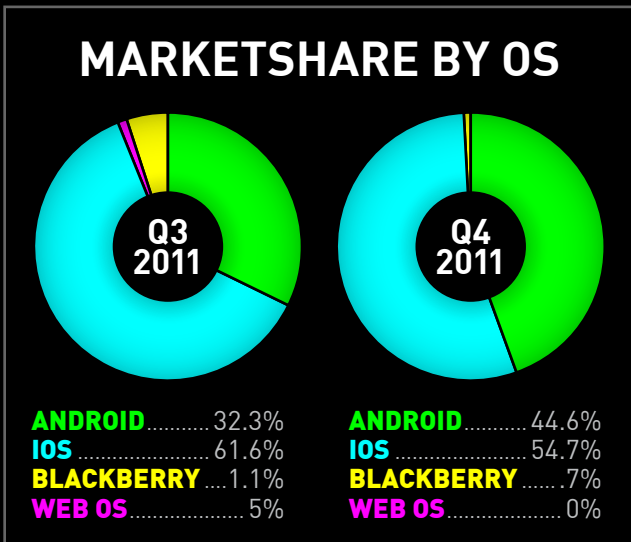
You may need to wait until you're over 10,000 feet to read Distro, but it'll be worth it. My review of the new iPad is here along with a review of two very different kinds of tablets, the Wacom Intuos5 touch and the Acer Iconia Tab A200. If you're not into tablets of any type, we have a review of the Samsung Rugby Smart while Ross Rubin's latest Switched On makes the case for slates as playthings. Don Melanson brings a new batch of Recommended Readings, IRL tests more ways to keep you charged on the go, technology news icon Patrick Norton sits down for a Q&A and Box Brown has yet another great comic for you. Whatever your chosen resolution, I hope you enjoy. 



TIM STEVENS  
EDITOR-IN-CHIEF,  
ENGADGET

# Android Tablets May Lead the Pack by 2016

They're not center-stage right now, but Android tablets are still predicted to overtake the iPad within the next three years, according to IDC. The forecasters noted that Apple's worldwide share of the tablet market is shrinking with each new lower-priced Android competitor. Even as iPad sales continued to grow in 2011, surging 50 percent between Q3 and Q4, its market share fell during the same period, from 61.5 to 54.7 percent. That gives the iOS slate a weaker lead going into 2012 than suggested by earlier figures. Of course, the iPad remains an individual starlet in front of a troupe of Google dancers, so Apple's position as the upper-most vendor isn't under threat. In fact, IDC predicts it will remain the market leader in terms of revenue beyond 2016, which ought to put some fire in Amazon's belly. — *Sharif Sakr*





# TABLETS ARE TOYS. NO, REALLY

*Switched On*

**BY ROSS RUBIN**

Ross Rubin (@rossrubin) is executive director and principal analyst of the NPD Connected Intelligence service at The NPD Group. Views expressed in Switched On are his own.

Ever since the tablet market exploded, we've seen a wide range of designs find both success and failure. But most of the tablets on the market have something in common: they are primarily designed for adults or at least children old enough to be responsible for a fragile device. Particularly for the popular iPad, we have seen a number of specialized cases designed to protect the tablet for use with young ones. But a small cadre of tablets aimed specifically at kids — including preschoolers — begs several questions. Are tablets good tools for kids? Is there value in optimizing them for kids? And if so, how should they be optimized?

Clearly, kids are drawn to tablets at least as much as they are other digital platforms such as smartphones and PCs. The increased focus on ease of use means that there are fewer issues around navigating file systems, folder hierarchies, and other configuration issues. In addition to being less complicated compared to PCs, they provide a richer media experience than smartphones, and their larger surface areas not only provide a bigger canvas for content but are arguably a more stable and forgiving one than smartphones or the likes of an iPod touch.

With support for full web pages not a key priority and weight and size even more of an issue for younger, weaker arms, seven inches seems to be the de facto kids' tablet size. This generally helps to keep prices at around \$200, which is inexpensive for a tablet, but expensive for a toy. The hardware expense may be justified by the relatively low cost of software, especially compared to PCs or game consoles, even as many parents may not like the prospect of ad-supported freeware games.

And there is something about the combination of a relatively large and touch-enabled display that has opened the door to specialized accessories. Several toy and game makers — from

Discovery Bay Games to giants such as Disney and Mattel — have released physical add-ons that interact with digital games to create experiences that live somewhere between a game and a toy. But many of those products are exclusive to the iPad, at least for now.

At least until they can attract enough popularity to woo such app developers, kids' tablet vendors seem to be relying on a few differentiating approaches beyond price:

### **Ruggedness and Design**

Donning what may be the defining characteristic of the subcategory, all kids' tablets have some kind of rubbery coating to prevent damage to the display or other parts. This can have the added advantage of minimizing the importance of thinness, a quality that commands a premium in the general tablet market, and thus allowing further cost reductions.

### **Accessories**


If they will not come (at least not yet), build it (yourself). Oregon Scientific, for one, plans to go all-in in the kids' tablet market with a host of accessories, including a piano keyboard, game controller and a creative case that serves double duty.

### **Content**

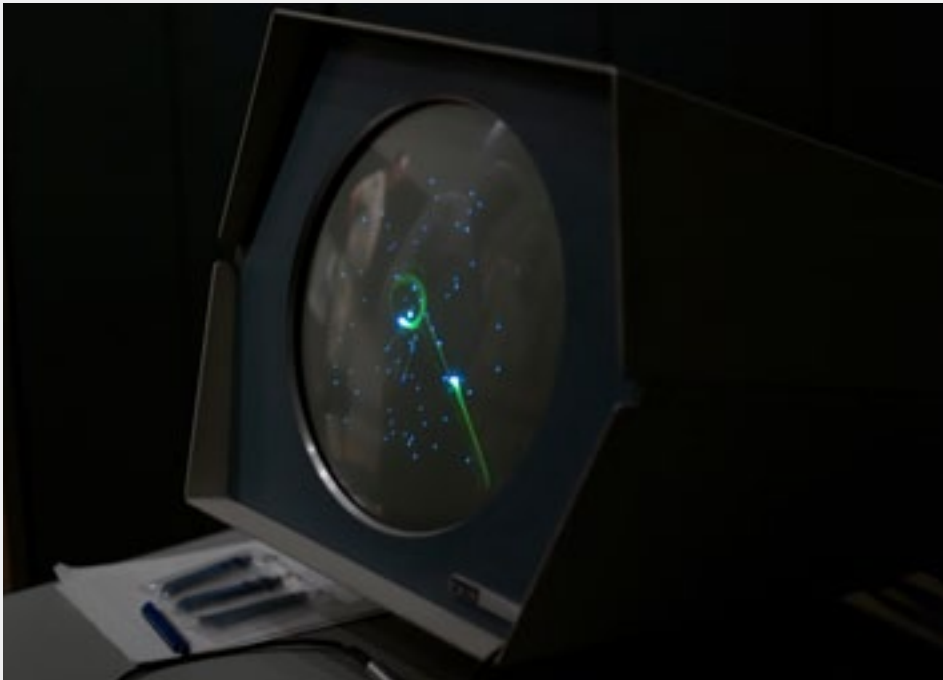
Perhaps the most vertically integrated of the kids' tablet makers, Vinci has created its own expanding line of educational software apps for the preschool set, starting as young as toddlers. Its curriculum is divided into three levels,

**All kids' tablets have some kind of rubbery coating to prevent damage to the display or other parts.**

each with six modules (with the exception of Level 1, which does not include a science component).

Some kids' tablet makers, though, are taking the opposite tact on specialization, and trying to straddle the markets for parents and children. The website of kids tablet maker Nabi, for example, hedges that its tablet is “powerful and entertaining enough for adults.” Indeed, the strongest competitors these tyke-targeted tablets will likely face is not each other, but hand-me-downs from their parents and perhaps older siblings. While the new entrants may be low-priced, they are certainly not less expensive than the tablets already owned. 





# The Longform Guide to Early Computing



by Max Linsky  
*Slate*

Yes, this is one reading round-up recommending another round-up, but if there's one collection of must reads this week, it's this one put together by *Longform* and published on *Slate*. In it are eight key pieces tracing the history of computing, the earliest being Stewart Brand's 1972 article on *Spacewar* for *Rolling Stone*, and the latest of which is Ian Parker's exhaustive history of PowerPoint for the May, 2001 issue of *The New Yorker*. In between those are two of the best pieces ever published by *Wired* — Gary Wolf's profile of Ted Nelson's Xanadu project from 1995 and Neal Stephenson's massive "hacker tourist" piece from 1996 — as well as a little something from someone named Tom Wolfe.

## AROUND THE WEB

### The NSA Is Building the Country's Biggest Spy Center (Watch What You Say)

by James Bamford



*Wired*

The latest *Wired* cover is certainly an ominous one, showing a nondescript building under construction in the Utah desert. That building is the NSA's new spy center, and the story behind it by James Bamford is a compelling one that, as you might expect, raises more questions than it answers.

### The Origins of Futurism

by Bruce Sterling

*Smithsonian*



Part of a *Smithsonian* magazine's ongoing series on futurism, this piece by sci-fi author Bruce Sterling gets right to the heart of the matter by examining the history of futurism itself — something Sterling sees as useful even though "tomorrow obeys a futurist the way lightning obeys a weatherman."

### Wikipedia Didn't Kill Britannica. Windows Did

by Tim Carmody

*Wired Epicenter*



Plenty was written following the announcement that the Encyclopedia Britannica would cease to be published in print, but this piece by Tim Carmody managed to stand out, offering both context and insight like this killer line: "Print will survive. Books will survive even longer. It's print as a marker of prestige that's dying."

### 'Boy CEO' Mark Zuckerberg's Two Smartest Projects Were Growing Facebook And Growing Up

by Ellen McGirt

*Fast Company*



Drawing on interviews dating back to 2007, Ellen McGirt pieced together a portrait that looks not just at Zuckerberg himself, but the culture he's developed at Facebook — including the oft-discussed "Hacker Way" that Zuckerberg cited at length in the company's IPO filing earlier this year.

*Recommended Reading*



# Wacom Intuos5 Touch

The Intuos5 gets high marks for its fresh design and on-screen reminders. We just wish the multitouch gestures were smoother.

BY BILLY STEELE

**It's no secret** Wacom has a firm grasp on what it takes to make great graphic input devices. Fresh off of its introduction of the Inkling last fall, the outfit recently unveiled the latest member of its high-end pen tablet line, the Intuos5 touch. Essentially, Wacom took what made the Intuos4 a great addition to any



designer or illustrator's workflow and refined it, with this latest iteration sporting a new rubber-coated shell. It also implements touch gestures — much like those on the fresh Bamboo models — which can be customized to speed up tasks you need to complete on the regular, preferably without the aid of a mouse.

Sure, a new matte black suit and the ability to navigate Adobe Creative Suite without a pen seem impressive at first glance, but is the new model worth investing northward of \$229? Are you better off sticking with the Intuos4 you splurged on a while back? Let's see.

## Hardware

We're going to go ahead and get this out of the way early: the Intuos5 touch is a mighty dapper device. Seriously, it looks amazing. The outer frame is coated in a rubberized matte black finish with no text indicators or printed markings interfering with the paint job. The medium-sized version we tested is crowned with an 8.8 x 5.5-inch (224 x 140mm) active area that offers a whopping 48.4-square-inch work surface. Backlit bracket indicators delineate the boundaries of the input area to keep you from swiping a tad too far while working on Illustrator files. The input portion of the topside



is coated in a semi-gloss finish, which allowed our hand and fingers to glide along with *a bit* more ease.

The so-called ExpressKeys and Touch Ring are just to the left of the work surface (if you're right handed, of course) but can be easily configured to work from the right side too. Four of these programmable buttons lie above the ring, with another four just beneath it. Here, too, Wacom has done away with any printed text, leaving only some backlit indicators around the Touch Ring to show which of the four commands you've selected. We think the absence of text is a nice touch, and the choice to keep everything on-screen a wise one. Take a closer look at the ExpressKeys and you'll notice the middle two in each set of four have a raised dot and raised bar, respectively. These allow you to navigate the controls by feel, so that you don't constantly have to look away from your PC toward the device.

**WE'RE GOING TO GO AHEAD  
AND GET THIS OUT OF THE WAY  
EARLY: THE INTUOS5 TOUCH  
IS A MIGHTY DAPPER DEVICE.  
SERIOUSLY, IT LOOKS AMAZING.**

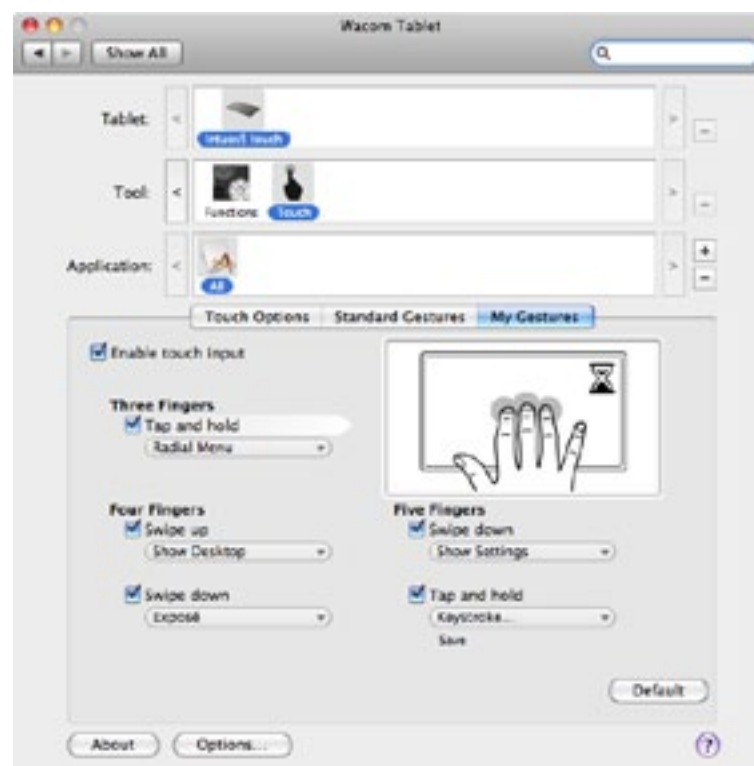
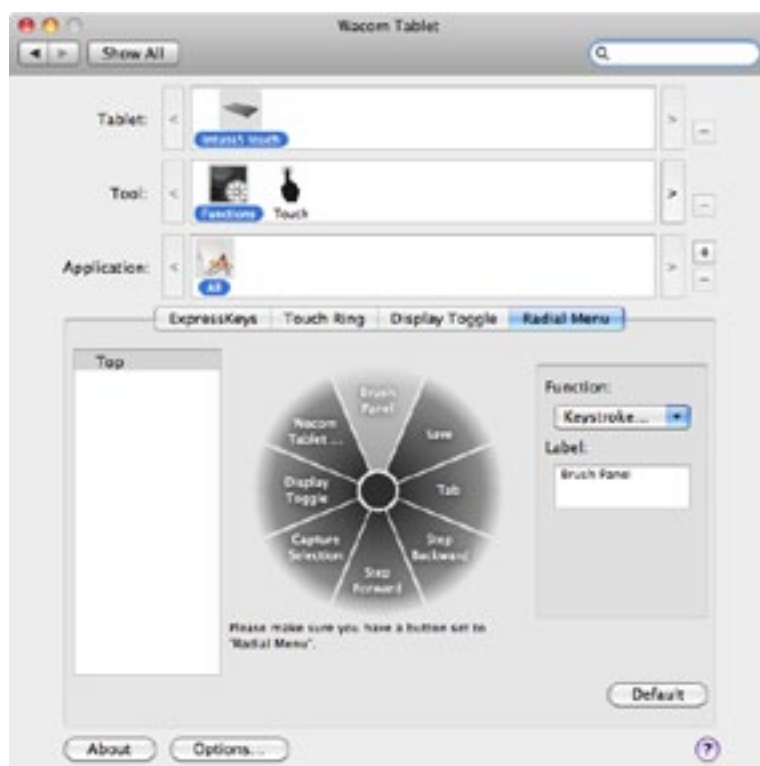
It's not surprising that most of the action takes place on the device's front face, but there's still more to see as we tour the hardware. Hopping around to the side opposite the ExpressKeys, there's a mini-USB socket for plugging into your work machine. To the left of said port is the resting spot for half of

the wireless kit. After removing two small covers on the bottom of the device you'll gain access to both the wireless components and battery slots, both of which allow the kit to be used sans cable (up to nine hours on the medium-sized unit, according to Wacom). Also worth a mention here is the clip attached to the miniature end of the included USB cable. It's a small, but nice touch to keep the excess cable length from getting in your way.

And then there's the pen. That piece of the kit that you'll be touching day in and day out is as comfortable to hold as ever. We didn't notice any change here, as the grip, click buttons and eraser features have all carried over from the previous generation. Another feature Wacom's chosen to bring back this go 'round: 2,048 levels of pressure sensitivity. The included desktop stand houses ten different nibs (also brought back from the previous model), which the company recommends you switch out regularly in order to protect your tablet from unnecessary wear. As we noted in our hands-on, both the Intuos4 and Cintiq pens work just fine with the new tablet. You know, just in case you've broken in that pen just how you like it over the past year or so.

## Setup

About 15 to 20 minutes passed from the moment we inserted the installation CD until we were ready to fire up Creative Suite. Of course, this depends on how fast your internet connection



can download the latest drivers from Wacom's site. We were then able to use the software to program the ExpressKeys, Touch Ring and touch gestures just how we like 'em. Also, we went ahead and set up mapping so that our dual-display workstation would play nice with the active area of the tablet.

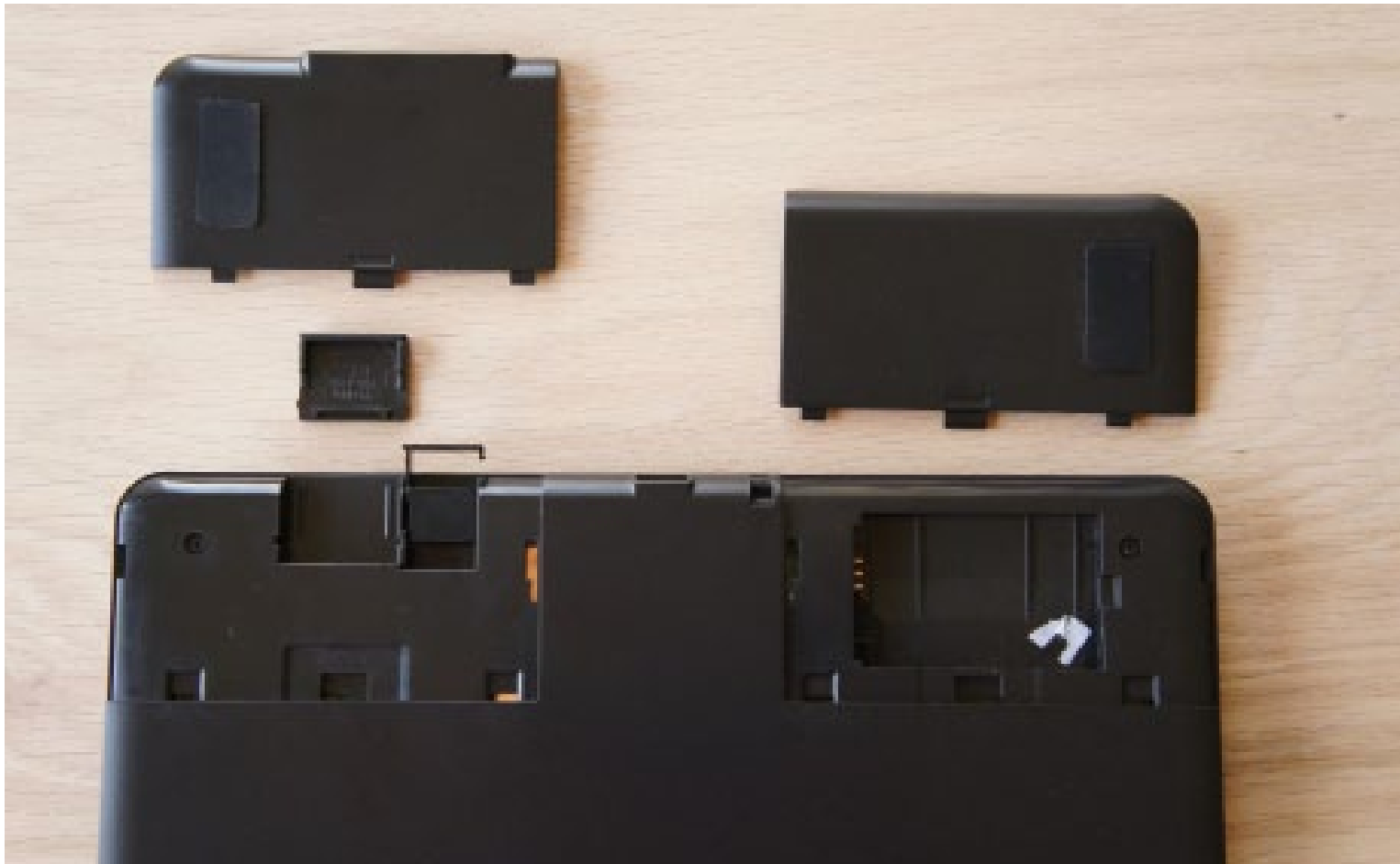
## Software

Using a series of menus, much like what you'd encounter in the preferences window of other applications, we were able to set up custom commands and gestures in a matter of minutes. It wasn't hard to find exactly what we needed and to lay our tools out on the workbench, so to speak. The second ExpressKey from the top brings up the Settings display, and from there we were easily able to navigate to both critical and touch-centric settings without having to open a separate program.

Worried about the absence of OLED indicators on the tablet's surface? Don't

be. Sure, there was a bit of an adjustment period for us, but once we got used to the on-screen heads-up display, things progressed nicely. If you forget which ExpressKey did what, resting your finger on top of one will bring up an on-screen reminder for the entire set. When clicking through the Touch Ring's four programmable tools, you'll also see an indicator pop up letting you know which option you're currently using. Honestly, this is a great improvement, and it sped up our workflow nicely once we got the hang of things.

Another nifty feature is the Radial Menu. Access to this HUD can be attached to an ExpressKey for quick and easy task selection. The Radial Menu can house up to eight tasks that you would normally grab from a menu or toolbar with sub-menus for each as an added perk. You can also adjust the pen's sensitivity to your particular workflow. Doing so will ensure that those swipes across the active areas do exactly what



you want them to and with the intended pressure for the task at hand.

### Touch Gestures and General Use

Overall, the Intuos5 performs just as well, if not better than its older siblings. The active surface / pen combo is incredibly sensitive and responds nimbly, and accurately, even to quick motions. And throughout our testing, we never suffered a bit of lag either.

Here's where one of our lone issues with the pen tablet lies: the touch gestures. Don't get us wrong, the ability to use our fingers on the active surface is a welcome addition and works quite well in some instances. Pinch to zoom, scrolling and simple navigation work great using multitouch. It was wonderful to carry out some tasks with our non-pen hand to keep things snappy. We were also happy that we never ran into a sit-



uation where the tablet got confused between our fingers and the pen. Touch capabilities are automatically disabled when the device senses its native pen is ready to jump in the driver's seat.

However, things like selecting text to be copied or modified and more precise selections / movements left a bit to be desired. This is most likely due to the surface of the tablet being not quite as touch friendly as what you'd encounter on a tablet PC or a Magic Trackpad. The surface isn't quite as slick as those aforementioned devices either, so



our swipes were met with some slight resistance. It's clear that Wacom chose to add touch to the active area instead of forgoing a proven technology some other touch-friendly surface. And we can't dock it too much for that.

That said, the ability to program these multitouch gestures *almost* made up for their shortcomings. Not only could we customize the ExpressKeys and Touch Ring, but we also made programs like Corel Draw carry out tasks with just a three-finger swipe. By default, the gestures correspond to stock OS X or Windows functions — again, similar to Apple's Trackpad. Currently, the software only supports five simultaneous points of contact, but the tablet itself is ready for up to sixteen — should you need to use both hands (and some toes) at some point in the future.

### Accessories and Size Options

One of our biggest gripes with the Intuos5 is that the Wireless Accessory Kit is sold separately. Sure, we get that the ability to go wireless usually comes with some added cost (\$40 in this case), but we'd at least like to see a bundle so that we don't have to make two separate purchases. We're also well aware that unless you can keep your workdays under eight hours, you won't go far without a USB cable. And for yours truly, at least, those are few and far between. However, if you've already sprung for the wireless kit for your Bamboo tablet, it should work with the Intuos5 as well.

Worried the stock pen just won't get the

job done for every project? Three additional ones (Art, Classic and Airbrush) are on offer too. The Classic offers a slimmer profile than the stock pen and will set you back \$70. Art and Airbrush offer the feel of felt markers and a digital airbrush, respectively, complete with ink / spray simulation. Those cost \$100 apiece. If you're looking to stay mobile, Wacom offers cases for each tablet size, with accessory pockets for cables and such.

### HONESTLY, WE'RE NOT SO SURE THE NON-TOUCH VERSION WOULD BE WORTH THE INVESTMENT

As we mentioned before, we tested the medium-sized Intuos5, which costs \$349. If you're in the market for something a little more petite (or expansive, even), small and large options are also available. The littler pen tablet offers an active area measuring 6.2 x 3.9 inches (157 x 98 mm) and will set you back \$229. Looking to give yourself plenty of room while working in CS5? You can opt for the large Intuos5 with a 12.8 x 8.0-inch (325 x 203mm) pen pad and an 11.8 x 7.5-inch (299 x 190mm) multitouch area. You'll pay \$469 for the privilege of such spacious real estate. All told, that's comparable to what Wacom charged for the last-gen Intuous4. There's also a fourth option reportedly on the way: a medium offering without multitouch gestures. Honestly, we're not so sure that would be worth the investment; however, we expect it to be


the least expensive of the bunch.

Not that it's our place to guess your preferences, but after spending a week with this thing, we suggest you think twice about grabbing the smallest tablet if you're running a dual-screen system, especially if you're mapping the tablet to both displays. The medium size worked great for us, but we can't imagine being comfortable with fewer square inches.

### Wrap-Up

Overall, we're quite pleased with the improvements that Wacom has made between the Intuos4 and the new Intuos5. Its dashing good looks are just the tip of the iceberg, er, pen. The feel of the tablet is much more inviting than the plastic finish of yore. This outer shell makes you *want* to touch the slim device, which is something you'll be doing plenty of, thanks to those multitouch gestures. Moving the ExpressKey labels to the on-screen HUD was also a solid move. It'll take some getting used to, but we realized it ultimately cured our habit of constantly looking down to find our bearings.

Sure, we have some gripes concerning the need to purchase a wireless kit separately and its imperfect response to touch input. For us, though, those two demerits are hardly deal-breakers. The multitouch features aren't flawless, but they add great functionality to the workflow for Photoshop and other design software, and can be used to access tools that without digging through menus. If you're still clinging to an older Wacom model or feel the Intuos4 hasn't run

its course, we don't think you'll regret splurging on a new model, especially if you already have the wireless kit lying around. Well, at least you won't mind the expense *after* you get your hands on one, that's for sure. 

*Billy is a Contributing Editor at Engadget, sports a pretty decent beard and desperately wants to be on Wipeout.*

## BOTTOM LINE

### Wacom Intuos5 Touch

\$229+

#### PROS

- Great design and ergonomics
- Responds well to pen input
- On-screen HUD for button reminders
- Programmable ExpressKeys and Touch Ring

#### CONS

- Touch gestures can be flaky
- No bundle option with the wireless kit

**The Intuos5 gets high marks for its fresh design and on-screen reminders. We just wish the multitouch gestures were smoother.**





# Samsung Rugby Smart

The Rugby Smart is clearly the best option in its class. Unfortunately, being the top rugged smartphone doesn't mean much.

BY TERRENCE O'BRIEN

**Not every smartphone** stakes its claim on speedy processors, huge gorgeous screens or slim and sexy physiques. Some take a relatively modest set of specs and add a little wrinkle to make them stand out from the crowd. The Samsung Rugby Smart is one such device. Though it adds Android to what we'll now refer to as the





Rugby Dumb, we can already tell you this handset isn't for the spec snobs among you. But, if you're more concerned with durability and tank-like construction, you might want to stick around a while. This AT&T-branded phone is built to mil-spec 810F standards, meaning it's shockproof, dustproof and can be immersed in up to a meter of water for up to 30 minutes. If these are qualities you desire in a phone, meet us in the paragraphs that follow to see how it stacks up against its competition.

## Hardware

The Samsung Rugby Smart is easily the sleekest of the supposedly military-grade smartphones we've laid hands on... at least since the Motorola Defy. That's not saying much, though. The field isn't particularly crowded, and compared to phones like the G'zOne Commando, even a brick would seem like an ergonomic miracle. At 12.19mm thick the Rugby is hardly svelte, but

it's almost a full 3mm thinner than the Commando. (To give you some perspective, the Galaxy Nexus is another 3mm skinnier still.) The most notable physical difference between the Commando and AT&T's durable new addition is the height. Despite having a slightly larger screen (3.7 inches versus 3.6), the Rugby Smart is actually 6.1mm shorter.

It's quite pedestrian in appearance and there's very little that hints at its abuse-absorbent design. The body is fashioned primarily out of plastic, with rubberized grips on the side and a sheet of tough, scratch-resistant glass up front covering a 480 x 800 Super AMOLED panel (yes, kiddies, that means this is PenTile). Sadly that display and protective cover conspire to keep sunlight visibility to a minimum. The screen simply doesn't get bright enough and the glass is extremely reflective.

The Rugby bucks the recent trend towards capacitive keys, and instead sports four physical buttons up front.



They're lightly textured and depress with a rather satisfying click, though for all sound produced they have surprisingly little travel. The right edge of the phone is home to the power / lock key and over on the left is the volume rocker. A nifty trick: hold down volume-up to use the blindingly bright LED flash as a torch. In what has become a pretty standard layout, the micro-USB port lives on the bottom, with the headphone jack up top. Both are hidden behind plastic doors designed to keep out dust and dirt. You'll also find the pair of cameras in the usual places — the primary 5-megapixel shooter 'round back and a 1.3-megapixel cam up front in the top left-hand corner.

Despite being largely plastic, the phone feels solid in the hand, if not exactly "premium." The rubberized grips lend some

gravitas to its design and, at 4.4 ounces, it weighs slightly less than the glass-and-metal iPhone 4S. The rounded backplate and its raised diamond pattern don't feel quite as tactile as soft touch plastic, but the phone should rest comfortably in your hand nonetheless. The most distinguishing physical feature is the lock on the rear, which holds the battery cover in place. It doesn't seal the door any tighter to keep out water, but it does prevent it from flying off when dropped — say, 10 feet onto a rock-strewn driveway (guilty).

## Performance

Underneath that impeccably sealed hood is a rather paltry 512MB of RAM and a 1.4GHz, single-core Snapdragon S2. For casual use these components are passable, if noticeably slower than



BENCHMARK	RUGBY SMART	HUAWEI HONOR	PANTEC BURST	AT&T GALAXY NOTE
Quadrant <sup>1</sup> (v2)	1386	N/A	<b>3,189</b>	2,667
NenaMark 1 <sup>1</sup> (fps)	41.48	52.2	<b>56</b>	54.9
NenaMark 2 <sup>1</sup> (fps)	22.8	30.3	<b>53</b>	36.3
Neocore <sup>1</sup>	59.4	<b>59.9</b>	56.2	55.6
Linpack single-thread <sup>1</sup> (MFLOPS)	50.09	<b>52.83</b>	50.1	42.98
SunSpider 0.9.1 <sup>2</sup> (ms)	4,319.45	<b>2,428</b>	2,692	3,059
Vellamo <sup>1</sup>	758	N/A	<b>1,151</b>	554

Notes: <sup>1</sup> higher numbers are better <sup>2</sup> lower numbers are better

what you'll find in competing devices. While the performance isn't *unbearable*, per se, there does seem to be a bit of lag to almost every action — enough to infuriate the more impatient among us. In benchmarks the phone consistently brings up the rear. Sure, its relatively high clock speed helps it keep pace in the single-thread Linpack (it even edges out the decidedly higher-end Droid RAZR), but its 4,319.45ms finish in SunSpider is one of the worse runs we've seen in recent memory, as was its 41.5fps average in the graphics test NenaMark.



When compared to the rest of the rugged smartphone field, however, those numbers are pretty darn good. The Commando, its primary competitor at this point in time, settles for a measly 800MHz single-core CPU. Perhaps an even bigger plus here is the inclusion of 4G (or faux-G, as it were). While the other military-grade Android phones we've seen have been stuck with aging EVDO radios, the Rugby Smart packs an HSPA+ antenna that pulled down an average of 7.1Mbps — about five times what you can realistically expect from the Commando or Motorola Admiral, a rugged phone sold through Sprint. The Rugby Smart's upload speeds were equally impressive, hovering around 6.2Mbps near our New York City hideout.

The 1,650mAh battery was more than enough to get through a day of normal usage, and perhaps a bit more. Under the pressure of our constant manhandling early in the review process we had to pause and charge midday, but that



would probably make us the exception rather than the rule. On our standard battery drain test it stunned by blowing past the 11-hour mark which, if we hadn't witnessed it ourselves and double checked the settings, we would never believe. It finally petered out after 11 hours and 38 minutes of looping a movie.

## Software

We're sure the laggy performance of the sub-par hardware isn't helped any by the TouchWiz'd Gingerbread that limps along on the tiny screen. And, let's not kid ourselves, 3.7 inches is small by today's standards, and you'll realize it as you try to peck out messages with the cramped on-screen keyboard. Now, the fourth iteration of Sammy's Android skin is definitely a vast improvement over its predecessors and one of the less offensive customizations on the market, but that doesn't mean you've got to like it. Manufacturer-designed interfaces continue to be a contentious issue, especially around the Engadget compound. That being said, we'd rather deal with TouchWiz than Blur on the Admiral or whatever it is that Casio did to Android with the Commando.

Less contentious is bloatware — and there's plenty of it here. Present and accounted for: AT&T Code Scanner, FamilyMap, Navigator, Live TV, myAT&T, Qik, QuickOffice, YellowPages, AllShare and, of course, Sammy's various "hubs." Some of the included software is uninstallable and, though there's thankfully no *Let's Golf* in sight,



we'd still prefer to be able to remove any app we want.

The lone bright spot, as far as we're concerned, is Kies air which turns your cellphone into tiny server that you can connect to wirelessly and manage your mobile from the comfort of your desktop browser. It didn't always work as smoothly as we would have hoped, occasionally refusing to download files from the phone, but it's still a good deal slicker

than plugging into a PC and opening your file manager. You can even connect a pair of Samsung handsets and share content between them with the app.

## Camera

The 5-megapixel camera certainly isn't a revelation, but it's a capable enough performer. In fact, images and video aren't materially different from those we captured with the Galaxy Nexus. Now, we weren't exactly blown away by that device's shooter either, but that's because it's a flagship handset and our expectations were loftier. The Rugby, on the other hand, is a middle-of-the-road device. Pics taken under particularly bright sunlight look a tad hazy and darker images show significant noise, but at least the color reproduction and white balance are decent. Given ideal lighting, it even manages to capture some rather impressive macro shots.

Video quality, on the other hand, is a bit disappointing. That single-core processor means you're topping out at just 720p, and noise reduction is basically nonexistent. Again, the color here is clear and balanced, but there is a noticeable amount of artifacting and wobble visible in frames — even when you're panning slowly. We've seen plenty of phones where the video can stand next to your average pocket camcorder and hold its own, but this just isn't one of them. It's fine for the occasional quick clip, but the movies produced are definitely more YouTube- than Vimeo-quality, if you catch our drift.




## Ruggedness

The Rugby's durability is something of a mixed bag. The fortified glass was as scratch resistant as they come, but we're concerned about its ability to absorb a strong impact without shattering. We haven't hit it with a hammer to find out just how easily it will break into a million pieces... yet. Still, we dropped the phone — repeatedly — on hardwood floors and rock-covered driveways and the phone came away with little more than a few scuffs. Even when we took it up to 10 feet. We have no sandstorms in New York City, so testing its dust-proofing was a bit hard, but we were able to submerge it in water. Now, we didn't put it three feet under for half an hour, but it's probably better that way. While it survived a glass of water for 20 minutes and a running sink for about five, there were some issues after the dunkings — something the Commando shook off with ease. In the immediate aftermath of a thorough soaking the menu button stopped responding and the touchscreen became much more



finicky. It (mostly) recovered after we left it out to dry, but the menu key still occasionally gives us fits. Granted, such abuse would have killed a lesser device — we've seen even a brief dampening destroy an iPhone — but we did expect a bit more from Sammy's tough handset.

## Wrap-Up

Well, this is a pretty easy decision to make, really. Are you on AT&T? Do you cherish the ability to give your phone a beating over laying claim to top-shelf specs? Then pretty much your *only* option is the Rugby Smart. Even if you're free to pick whichever carrier you please, this is still probably the way to go if you're in the market for a ruggedized smartphone. Though the Commando does seem to stand up to abuse a bit better, its significantly chunkier design, even paltrier specs and egregiously customized take on Android make the Rugby Smart the clear champion. And, unless you absolutely need a QWERTY keyboard, we can't find a compelling reason to recommend the Admiral over this. That's not to say there aren't drawbacks, obviously. The performance is hardly brisk, and the modest screen might pose a challenge to the large callused hands for which this was clearly intended. Still, if you're looking for a smartphone you'll feel comfortable taking out in a hurricane, this is it. 

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*Terrence is too complicated and multifaceted to be reduced to pithy one liners. He's also kind of a jerk.*



# BOTTOM LINE

## Samsung Rugby Smart

\$100

### PROS

- Solidly built, relatively sleek design
- Best choice in its niche
- Long battery life
- Decent photo quality

### CONS

- Frustratingly slow
- Not all bloatware is uninstallable

**The Rugby Smart is clearly the best option in its class. Unfortunately, being the top rugged smartphone doesn't mean much.**





# Acer Iconia Tab A200

Acer's Iconia Tab A200 delivers acceptable performance for a mid-range, dual-core Android slate. Get this if you need to have ICS now. Otherwise, its closely priced, older rivals make for a better buy.

BY JOSEPH VOLPE

**It's a tired promise** for too many gadgets: Ice Cream Sandwich, just like the Gingerbread man before it, is coming... soon. You have to hand it to Acer, then, for bypassing those vague release schedules and actually pushing out a software update to the A200 on schedule. And though its specs are fairly run-of-the-mill (a 10.1-inch, 1280 x 800 display and 1GHz dual-core Tegra 2 SoC), it could nonetheless be a tempting deal — after all, you don't see too many \$330 10-inchers running Android 4.0.

The problem is, better things are around the corner, and the price wars rage on in the meantime. As it is, the A200 went relatively unnoticed at CES as Acer unveiled the Tegra 3-toting A700. The existence of that next-gen tab alone should raise a few red flags for consumers thinking of hopping aboard the Android tablet train. What's more, NVIDIA CEO Jen-Hsun Huang has already promised sub-\$300 Tegra 3 tablets are on the way (ASUS even confirmed one!). So is this just a case of bad timing for what is an otherwise respectable tablet? Should you hold onto those hard-earned greenbacks until the market becomes flush with affordable quad-core slates? Or will its immediate availability and reasonable price make for an irresistible purchase now? Join us as we tackle those very questions and give this tablet the fair shake it deserves.

## Hardware

Admittedly, tablet design is an inflexible province: there's only so much manufacturers can do with rectangles, aside from folding them (see: Sony Tablet P) or molding them in the shape of magazines (Sony again, this time with the Tablet S). So that leaves us with build quality and thickness, with the A200 measuring 6.9 x 10.24 x 0.49 inches (175.3 x 260.1 x 12.5mm) and weighing in at a 1.59 pounds (721.2 grams). As you can tell from those measurements, Acer's clearly not positioning this slate as an iPad opponent — it's just too girthy and heavy to compete aesthetically.



Don't confuse that additional bulk as an indication of subpar construction, though. You can quite literally feel the attention to detail in its non-slip, textured metallic grey back and the subtle curves leading up to the bezel in portrait mode. Grip this thing in landscape and it's a quite less comfortable experience, one marred by industrial flat edges and two ill-placed speakers.

Acer's made ample use of the A200's available real estate, filling up most every side with dedicated functions. The majority of your I/O needs are met along the left landscape side, which is occupied by a 3.5mm headphone jack, micro- and

standard USB ports, covered microSD slot and power button. Above this array lies a silvery volume rocker, punctuated by three raised dots for easy tactile recognition, and an orientation lock, while a jack for the DC charger rests by its lonesome on the opposite edge.

On the back, you'll find the company's logo embedded in the midst of that hard rubber casing and two speaker grills placed equidistant at the base. Below that non-removable enclosure resides a 3,260mAh Li-ion battery and a (now antiquated) dual-core 1GHz Tegra 2 CPU. If you're wondering about the tab's camera setup, be prepared for a shocker: it only features a 2-megapixel front-facer. You read that right: there's no rear shooter to speak of, and while that'd be a major con on a handset, tablets aren't really the go-to device for photography anyway, so this omission is easy to overlook.

Look at the A200 head-on and there's not much cluttering up its face. Logos denoting this as an Iconia Tab iteration and Acer product make subdued appearances, with the only other visible interruption coming in the form of that front-facing cam. As we mentioned previously, the A200 is mostly indistinguishable from other tablet entries. The real difference pertains to the software it runs: Android 4.0.3. Before you can even dive deep into that Googlefied OS, you'll immediately notice the lack of pixel density on its 1280 x 800 10.1-inch LCD display. Sure, it's enough to render video in 720p, but the loss in quality is noticeable, although definitely on par with other

mid-range slates. Indeed, viewing angles appear to hold up, but that's just the problem — we can't say for sure, owing to the extremely reflective glass covering the unit. Indoors, away from the glare of direct sun and overhead lighting *and* at full brightness, we still found ourselves jostling with the tablet to find an optimal position that would allow clear visibility. Truly, it's nigh impossible to do, as some glimmer of the surrounding environment will surely make an appearance on the screen. And believe us, we tried to make it work, but after 30 minutes of watching a film on Netflix, our hands were fatigued by the constant re-positioning.

## Software

So, the A200's display is rather lackluster, but on the upside, you do get to play around with a skinned build of Ice Cream Sandwich — and a light one, at that. Most of the tweaks that Acer's imposed here center around the lockscreen and homescreen menu bar. Whereas vanilla ICS allows you to unlock a phone or tablet by dragging an icon to the appropriate slot, the overlay on this tab highlights the available shortcuts — all customizable, of course.

Move on to the five homescreens and you'll see two yellow, concentric rings in the middle of the lower navigation bar that, when tapped, bring up a larger circle with sliding volume controls and recently viewed web pages on its outermost portion, shortcuts on the area just within and a search icon smack dab in the center. And there, friends, is where





the OEM's tinkering with Android thankfully ends; these are very subtle changes that manage not to weigh down the performance.

You've probably heard speak of NVIDIA's Tegra 3 — that quad-core chip that's begun to take residence inside a handful of upcoming phones and tablets. The A200, as a middle of the road tablet entry, doesn't take advantage of that next-gen spec boost, opting instead for a dual-core 1GHz Tegra 2. So let's keep our focus on its market positioning and real-world performance, not the lack of a marketing bullet point. As a mid-range tablet, Acer's tab generally does an acceptable job of keeping the hiccups at bay. Navigation through the home-screens is quick, but you'll note a minute amount of occasional stutter. The same applies to the app drawer which,

when triggered, fluctuates between an immediate response, followed by a slight delay. Unfortunately, that inconsistency is evident throughout, and has a special tendency to rear its ugly head when loading applications, frequently prompting force-closes across various apps.

When it comes to Android tablets, access to the stock Google apps and a sprinkling of bloatware is something of a given. In keeping with tradition, Acer's shoveled a considerable amount of applications onto this slate, though surprisingly, it's also thrown Amazon's Appstore into the mix. It's a puzzling and redundant inclusion, as it merely offers users an alternative route to the same fraternity of apps available on Google Play. In addition to that oddity, users will find Amazon MP3, Kindle, the Astro file manager, Acer's Clear.fi

BENCHMARK	ACER ICONIA TAB A200	MOTOROLA XOOM 2	GALAXY TAB 10.1	TRANSFORMER PRIME
Quadrant <sup>1</sup> (v2)	2,053	1,841	2,083	<b>3,023</b>
Linpack single-thread <sup>1</sup> (MFLOPS)	37.2	<b>45.51</b>	16.9	43.35
Linpack multi-thread <sup>1</sup> (MFLOPS)	60.4	<b>68.87</b>	36.7	67.05
NenaMark1 <sup>1</sup> (fps)	45.6	20.1	42.5	<b>60.1</b>
NenaMark2 <sup>1</sup> (fps)	20.4	19.6	18.6	<b>46.1</b>
Vellamo <sup>1</sup>	<b>1,290</b>	1,060	886	953
Sunspider 0.9.1 <sup>2</sup>	2,251	2,229	2,200	<b>1,861</b>

Notes: <sup>1</sup> higher numbers are better <sup>2</sup> lower numbers are better

app for wireless media streaming, Docs to Go, Evernote, a Facebook shortcut, Netflix, Soundhound, TegraZone, Zinio, McAfee VirusScan, SocialJogger (Acer's homegrown social aggregation app) and AUPEO!, a Berlin-based music service. Acer's added the ability to disable a portion of these third-party apps and remove them from the app tray, but the option to outright uninstall is sorely missing; they'll still be running in the background.

Which brings us to the issue of storage. With 16GB allotted for the \$350 model and 8GB for the slightly cheaper \$330 version, users will realistically be dealing with an out-of-box deficit of 4GB devoted to bloat. While this shouldn't be quite as offensive if you choose the more capacious 16GB version, its lower-capacity sibling will come with a meager 4GB of available storage. Thankfully, you can expand the available storage by up to 32GB via that microSD slot.

## Performance and Battery Life

The A200's 1GHz SoC and the accompanying 1GB of RAM may seem like yesterday's top-notch tech innards simply because... they are. So to give you a good sense of its raw power we pitted it against a cross-section of Android tablets, ranging from the similarly specced Galaxy Tab 10.1 to the dual-core 1.2GHz ARM-powered Xoom 2 to the Tegra 3-equipped Transformer Prime. Unsurprisingly, Acer's tab can't hold a candle to ASUS' major leaguer; it's an unfair comparison, yielding consistent benchmark defeats. Stacked side-by-side against Moto and Sammy's tabs, however, and you get a clearer sense of how it fares.

Victories for the slate were uneven, overtaking (or in some cases barely beating) the 10.1 in both Linpack single- and multi-thread, as well as Vellamo — you can chalk that appreciable boost up to ICS's improvements. Sunspider 9.1 testing placed the tab's ability to render web pages speedily on par with its

two rivals, although it did lose out by a minor, albeit significantly slower increment. As this is a Tegra 2 tab and therefore the product of NVIDIA's obsession with gaming, NenaMark 1 and 2 scores were on equal footing with the 10.1, and outstripped the Xoom 2.

Having no cellular network connectivity undoubtedly equates to longer battery life, but being limited to a singular WiFi radio has a downside, too. Wireless reception on the A200 is exceptionally poor; it tended to drop down to just one bar of signal strength when we moved a room away from our high-speed home connection. If you have your sights set on this tab, expect to find yourself tethered close to that household, office or in-store router.

Issues of range notwithstanding, we found the 3,260mAh battery lasted us well over two weeks with extremely light usage, and a large bit of that longevity has to do with the slate's power management abilities. Let it fall asleep and you'll notice that, upon re-awakening, WiFi has been disabled. It's a handy feature, but we can see it annoying folks expecting a steady stream of audible notifications. Under the duress of our formal battery rundown test, in which we loop a video with WiFi on and the brightness fixed at 50 percent, the tablet lasted eight hours and 16 minutes — on par with early 10-inchers like the G-Slate and the original Xoom.

Full desktop pages on the A200's browser take a fair bit of time to load — we had to wait nearly 30-plus seconds for Engadget to completely render on

TABLET	BATTERY LIFE
Acer Iconia Tab A200	8:16
Samsung Galaxy Tab 7.7	12:01
Apple iPad 2	10:26
ASUS Eee Pad Transformer Prime	10:17
Samsung Galaxy Tab 10.1	9:55
Apple iPad	9:33
Motorola Xoom 2	8:57
HP TouchPad	8:33
Lenovo IdeaPad K1	8:20
Motorola Xoom	8:20
T-Mobile G-Slate	8:18
Samsung Galaxy Tab 7.0 Plus	8:09
Lenovo ThinkPad Tablet	8:00
Archos 101	7:20
Archos 80 G9	7:06
RIM BlackBerry PlayBook	7:01
Acer Iconia Tab A500	6:55
T-Mobile Springboard (Huawei MediaPad)	6:34
Toshiba Thrive	6:25


a high-speed connection. Pinch-to-zoom, however, does not entail the same sort of heel-dragging; the tablet managed to track our finger movements quite accurately while retaining the clarity of text and images. From time to time, however, you'll notice those dreaded white spaces surrounding your enlarged copy.



## Wrap-Up

Nearly three quarters of the tablet market may have tunnel vision when it comes to a platform of choice — that being Apple's iPad — but for the Android faithful, there are options readily available — a wide and confusing glut, at that. Into this melange comes Acer's Iconia Tab A200, a tablet whose sole distinction is its Android 4.0.3 OS. With a narrow range of configurations that are too closely priced for the slight storage upgrade offered and a processor that grows more dated and comparatively sluggish as the year progresses, it's difficult to hone in on a bright spot for the bulky slate.

Certainly, we've seen the pitfalls of its performance, shifting as it does between occasionally snappy transitions to minuscule, though noticeable choppiness. Then there's the bothersome illegibility of its über-reflective screen. It'd be easy to lay the blame for these software quirks on its dusting of a UX, but it's more likely that the company simply neglected to fully optimize its Tegra 2 core for this skinned OS. It's not as if sleeker, more responsive and critically praised slates aren't within reach. For an extra \$49, you can purchase the Galaxy Tab 10.1 or recently discounted iPad 2, each with 16GB of storage. If you choose to go that route, then all you're really missing out on is Ice Cream Sandwich and even then Samsung's promised to deliver that update very soon. Add to this confluence of cons the potential for sub-\$300

Tegra 3 tablets hitting shelves in the near future and you won't feel much inclination to whip out the credit card and commit to this capricious, and ultimately forgettable ICS slate. That forthcoming A700, on the other hand, might be worth the wait. 

*Joseph Volpe is ambiguously ethnic. He is also an Associate Editor at Engadget.*

## BOTTOM LINE

### Acer Iconia Tab A200

\$350

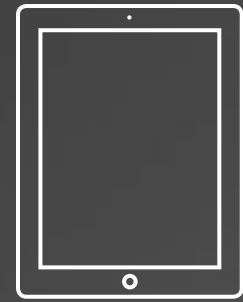
#### PROS

- Ships with Ice Cream Sandwich onboard
- Solid build
- Light software customizations

#### CONS

- Inconsistent performance
- Highly reflective display
- Average battery life

**Acer's Iconia Tab A200 delivers acceptable performance for a mid-range, dual-core Android slate. Get this if you need to have ICS now. Otherwise, its closely priced, older rivals make for a better buy.**



HEIGHT  
9.50 inches  
WIDTH  
7.31 inches  
DEPTH  
0.37 inch  
WEIGHT  
1.44 pounds

# Pixel Perfect?

Apple's New iPad Goes High-Res

BY TIM STEVENS



FEATURE  
REVIEW

# W

What's in a name? Or, more importantly, what's in a digit? Would that which we call an iPad by any number less than 2 be less sweet? ¶ That's the question Apple posed for us indirectly when it unveiled the new iPad and relegated its

future slates (and, presumably, phones) to a numeral-free future. And that new slate? It's much the same as the old one, with a slightly more chipper processor at its (quad) core and support for both Verizon and AT&T's fancy new LTE networks.

But there's one bigger change here, one that will ripple across the industry as each manufacturer struggles to keep up in this ever-accelerating market. That feature is the iPad's new 2048 x 1536 Retina display. It's the best display ever featured on a tablet, probably the best display ever on a mobile device, but is that enough to keep this tablet ahead of the pack? Believe it or not, the answer is yes.



## Hardware

Ever held an iPad 2? If so, suffice to say this *new* iPad is a wee bit thicker and a teensy bit heavier. You now have our full blessing to skip down to the display section below, which is what you're probably truly interested in reading about.

For those looking for the full-on review effect, the new iPad is still a slinky thing. Sure, its 9.4mm thickness won't win it any awards (especially since that's .6mm thicker than the iPad 2), nor will its 652g

(1.4-pound) heft (51g / .11 pounds more than before), but it feels neither big nor heavy. It instead feels substantial. Dense. It's carved from a hunk of aluminum and there's a cavity in there where the (now bigger) battery and other internals reside, but if you didn't know any better



**If you didn't know any better you'd think it were completely solid.**



you'd think it were completely solid.

There's none of the flex or the give found in the iPad's cheaper competition. That solidity certainly helps explain the premium feel, but buyers will have to decide whether that feel is worth the extra space in their messenger bags, or the extra strain placed on shoulder straps.

The chassis is hewn from the same matte aluminum as most of Apple's other devices, with a gentle curve on the edges tapering down to a flat back punctuated by a glossy black Apple logo. The shape of that taper is slightly different than before, a bit more rounded on account of that extra girth, but you'll be



hard-pressed to notice without a side-by-side comparison.

Looking at the back you'll still find the speaker in its same lower-left position, still a rather unfortunate placement. Most of the sound is therefore directed away from where you want it, namely in your ears, and we can't say as we noticed any improvement in the overall aural quality compared to this tablet's predecessor. Next to that is the dock port, still the full-sized 40-pin variety and not the slinky, next-gen connector that we've been hearing is in the works, so your accessories live on for at least one more generation of tablets.

Move up to the side and you'll find the same volume rocker and mute / rotation lock as before, situated in the same place, too. Kitty-corner to that is the wide and flat power button, separated from the 3.5mm headphone jack over on the other side by the same expanse of black plastic seen on the iPad 2, making room in the metal chassis for the antennas to do their thing. WiFi-only models get by without this polycarbonate indiscretion.

Swing around to the other top corner and you'll find the door behind which rests the SIM. LTE does need a SIM, even on Verizon, and the new iPad supports LTE on both AT&T and Verizon. (Rogers, Bell and Telus in Canada, too, though Telestra LTE in Australia is sadly not compatible.) There are different devices here, one for AT&T and another for Verizon, but either offers comprehensive non-LTE wireless connectiv-

ity options, including MTS / HSPA / HSPA+ / DC-HSDPA (850, 900, 1900, 2100 MHz) and GSM / EDGE (850, 900, 1800, 1900 MHz). That means even if you aren't in LTE-land you can expect up to 42Mbps download speeds, which is much faster than the iPad 2.

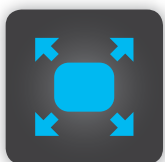
The WiFi-only models naturally lose all that, but all varieties offer 802.11a/b/g/n connectivity along with Bluetooth 4.0. Even the WiFi-only model can make use of the new voice dictation feature here, which adds a microphone button down next to the keyboard. In our testing it's impressively accurate, capturing even odd words like "Schenectady" without pause. It only works when you have an active network connection and, sadly, it's no Siri, which is still not available. The new iPad will not find you directions to body hiding spots nor tell you the weather.

The one final detail on the back is the slightly enlarged portal behind which the new 5-megapixel camera assembly peers through. It's rimmed by a bit of polished metal as on the iPad 2, so things don't look noticeably different from the outside, but as ever it's what's on the inside that counts — and indeed you'll have to look a little deeper in this review to see that new sensor.

The biggest change of all, however, is right there on the front, though tragically for those who like to make appearances, the black (or white) glass facade looks exactly the same as it did on the iPad 2. Turn it on, though, and everything changes.



**If you're disappointed Apple didn't do more with the new iPad, that's probably because you haven't seen the new Retina display yet.**



### Display

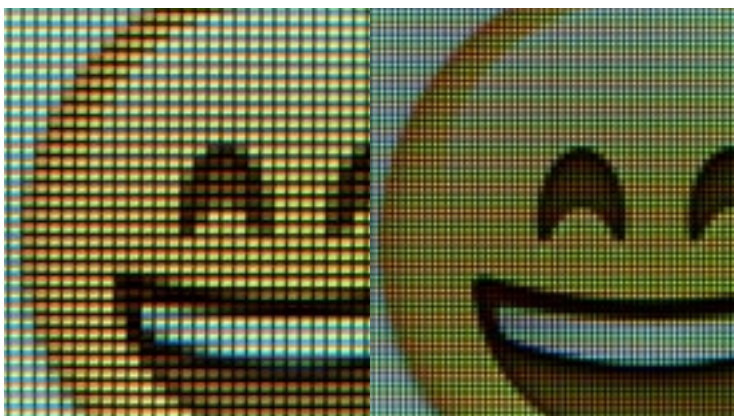
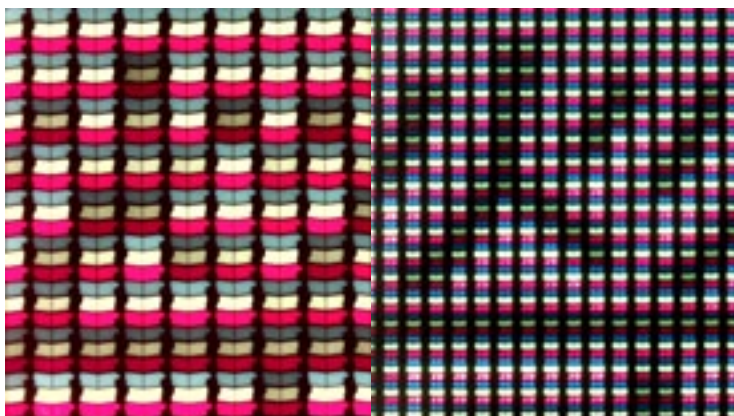
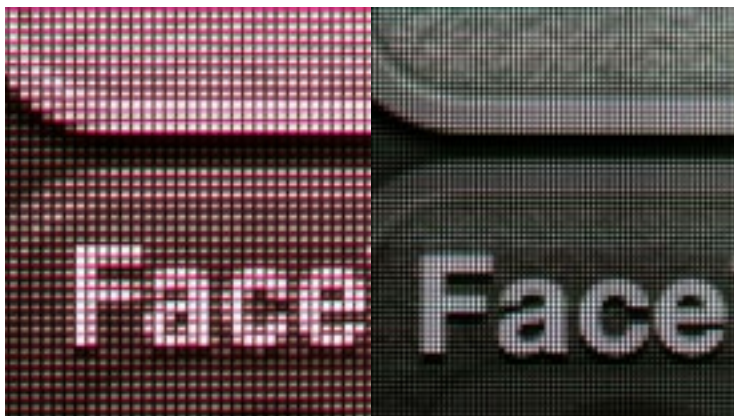
If you're disappointed Apple didn't do more with the new iPad, that's probably because you haven't seen the new Retina display for yourself yet. Take more than a passing glance and you'll be a believer. Of course, a cynic would say that it's Samsung who's been doing all the hard work here, as this is (for now, at least) a panel sourced from that company. That should be an indication that Apple's strongest competition on the Android side won't be far behind with its own high-res wonderslate.

The biggest talking point is, of course, the truly bonkers resolution. 2048 x

1536 means four times the pixels of the previous iPads and, indeed, a full million more than your average 1080p TV. On the 9.7-inch display this works out to a pixel density of 264ppi. That's considerably lower than the 326ppi the iPhone 4S manages and, indeed, below the magic 300ppi barrier Apple had earlier specified for the "Retina" moniker. But, as you're expected to hold the new iPad further from your face than your phone, the perceived pixel density is said to be comparable.

Really, though, the numbers will be quickly forgotten once you get a look at this thing. If you've previously made the





leap from a lower-resolution iPhone to one packing a Retina display you have some idea of what to expect here, but the increased scale really makes the difference shine.

For example, viewing photos on an iPhone was never particularly pleasant to begin with. It always felt too cramped — okay for a quick “hey, check this out” kind of experience, but not something you’d want to do for long stretches. Looking at photos on the iPad, however, has always been a very satisfying thing, and with the new iPad it’s even more so. Not only are things rendered to a higher definition, they’re also presented with greater accuracy.

The new iPad screen offers a considerably increased contrast and gamut, meaning colors are not only brighter and more striking, but more accurate. No, the reds and greens won’t beat you over the head like they do on one of Samsung’s Super AMOLED Plus displays, but everything here just looks *right*. That said, stack it next to an iPad 2 and you’ll notice the new display is far more cool, and you’re unfortunately given no control over that. A few pictures, like of a bright red Ferrari, actually look slightly more accurate on the old display, but by and large the new panel blows the old one away.

This is a spectacular display, and in typical IPS fashion it doesn’t disappoint at odd angles. It maintains its splendor at broad enough perspectives to ensure your friend on the other side of the couch can also enjoy your latest YouTube fave.



# Five Things You Need to Know

Apple's latest may be indistinguishable from its predecessor at a glance, but change isn't always skin deep.

## iSIGHT CAMERA

This 5MP rear-facing camera adds more than 4 megapixels and auto focus.

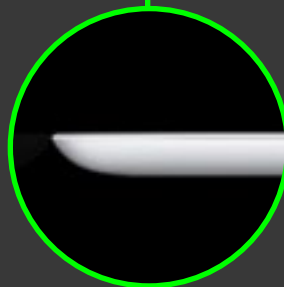


## PROCESSOR

The A5X contains the same dual-core CPU, with a new quad-core graphics component.

## DIMENSIONS

It's not a huge leap, but the new iPad is both thicker and heavier at 0.37 inches and 1.44 pounds.



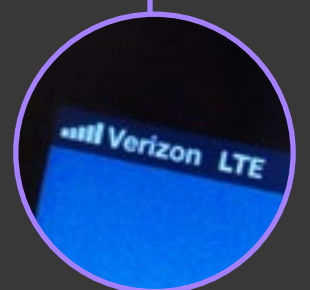
## RESOLUTION

Apple's 2048 x 1536 Retina Display is meant to make pixels indistinguishable.



## CELLULAR

With the new iPad comes the introduction of LTE and a "world-ready" approach.



Yes, there are a lot of hyperbolic adjectives up there in the preceding paragraphs, but that's simply because this is a genuinely nice display. It raises the bar, and that's a good thing. We can't wait to see how the competition responds.

Of course, to make the best use of this new display you'll need new apps that have been up-sampled to take full advantage, and thankfully there are plenty. All of the stock iOS apps have been retooled already, while many big third-party players like Amazon's Kindle app and Evernote have already been upped as well, and the difference is noticeable.

1080p content looks considerably better than on the iPad 2, as you would expect, but even 720p content shows a noticeable improvement. That shouldn't necessarily be a surprise, though, since the old tablet couldn't even manage that resolution.



### **Performance and Battery Life**

Adding four times the pixels means a lot more work for the CPU and GPU, and the trusty 'ol A5 processor just wasn't up to the task. So, Apple did a little... *augmentation*, creating the A5X. This processor keeps the same dual-core CPU as the iPad 2 but pairs it with a new quad-core graphics component. The result? Predictably the same when it comes to the CPU-taxing Geekbench, which gave us nearly the same score. The web-based SunSpider benchmark was the same. We averaged a low 2,100ms score on the iPad 2 and the new iPad averaged at 2,111ms.

So, don't be expecting a revolutionary change when it comes to day-to-day usage, but really we still find the iPad 2 to be far more snappy and responsive than just about anything else on the market. So too, then, is the new iPad.

This is the first iPad to offer 4G LTE wireless, and so we were naturally quite eager to load up Speed Test and see what it could do. We received a Verizon model to test and it did not fail to impress, delivering download speeds consistently in the 22 - 25Mbps down range. Uploads, meanwhile, hovered between 16 and 19Mbps with 50 - 70ms pings. That is, needless to say, quite healthy.

We also had the opportunity to test an Orange non-LTE model in the UK and saw speeds averaging 3.5Mbps down and just north of .5Mbps up. That too is respectable, but will likely leave you pining for the day the cooling rays of LTE show up in your hood, especially since the iPad can be used as a wireless hotspot for no extra cost.

We had high expectations for battery life, despite those substantial improvements to both the built-in radios and display. The new pack inside the iPad is rated at a massive 42.5 watt-hours. That's nearly double the size of the 25 watt-hour pack found in the iPad 2. The reason for the boost is to make sure there are plenty of electrons to shovel into the LTE antenna and the new A5X processor, both of which are presumably quite hungry.

Apple rates the new iPad at 10 hours of casual surfing on WiFi or nine hours if you're doing it using cellular data and our

GEEKBENCH	RESULTS (HIGHER IS BETTER)
Apple iPad (2012)	720
Apple iPad 2	721
Apple iPad	442
Apple iPhone 4S	623
Apple iPhone 4	375

own video rundown test gave a similar rundown time. At 50 percent brightness, our European model on HSPA pushed out just under 10 hours of constant playback, with 3G and WiFi on. That's barely half an hour behind its predecessor, despite this year's hardware improvements. Our Verizon LTE model, meanwhile, came in just 15 minutes shorter, again with LTE and WiFi firing.

It's worth noting, though, that all that juice not only takes a long time to drain but it takes time to charge, too. We've found the new iPad takes much longer to refill on the charging stand than the iPad 2. No surprise, given the nearly 100 percent increase in battery capacity.



## Cameras

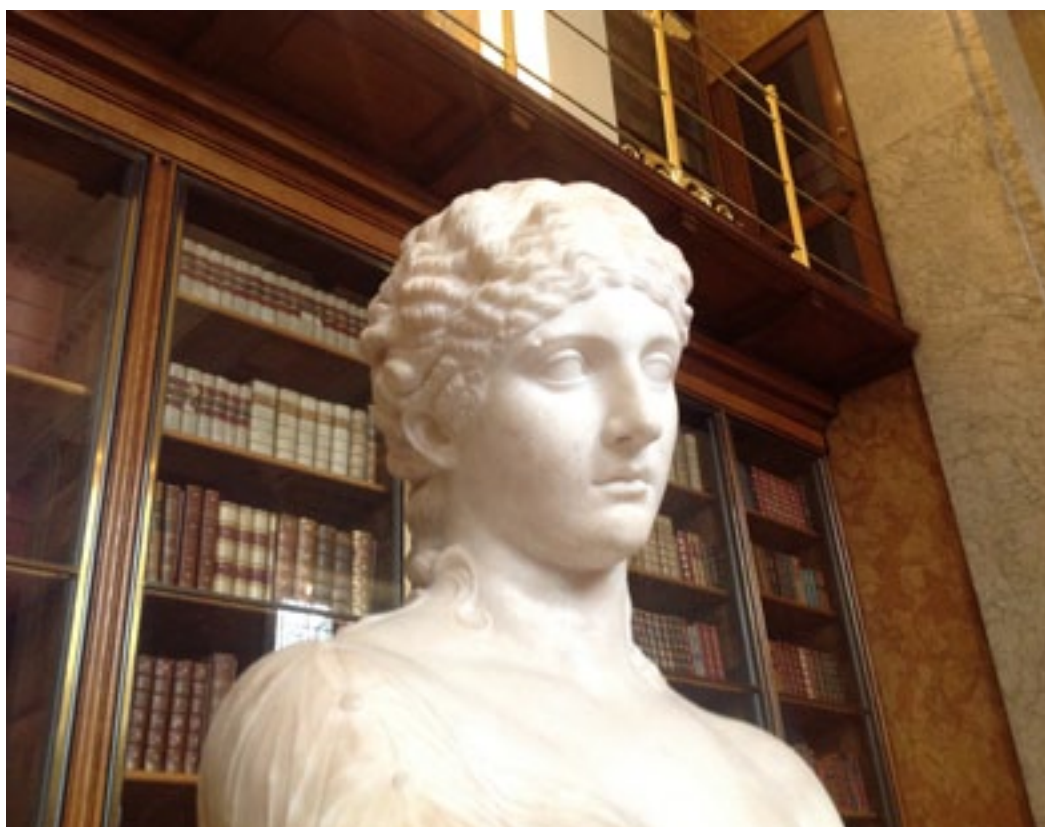
We called the cameras on the iPad 2 "pretty bad" and, well, they are. Thankfully Apple has finally raised the game on the rear shooter for the new iPad, but it's unfortunately left the front-facing VGA FaceTime camera alone. If you're sick of looking murky when FaceTiming with loved ones from a dimly lit room, we're sorry to say it might

TABLET	BATTERY LIFE
Apple iPad (2012)	9:52 (HSPA) / 9:37 (LTE)
Samsung Galaxy Tab 7.7	12:01
Apple iPad 2	10:26
ASUS Eee Pad Transformer Prime	10:17
Samsung Galaxy Tab 10.1	9:55
Apple iPad	9:33
Pantech Element	9:00
Motorola Xoom 2	8:57
HP TouchPad	8:33
Lenovo IdeaPad K1	8:20
Motorola Xoom	8:20
T-Mobile G-Slate	8:18
Acer Iconia Tab A200	8:16
Samsung Galaxy Tab 7.0 Plus	8:09
Lenovo ThinkPad Tablet	8:00
Archos 101	7:20
Archos 80 G9	7:06
RIM BlackBerry PlayBook	7:01
Acer Iconia Tab A500	6:55
T-Mobile Springboard (Huawei MediaPad)	6:34
Toshiba Thrive	6:25
Samsung Galaxy Tab	6:09
Motorola Xyboard 8.2	5:25
Velocity Micro Cruz T408	5:10
Acer Iconia Tab A100	4:54





SAMPLE  
IMAGES



be time to finally invest in that extra lamp.

Obviously, the company's time and effort was spent focusing on the lens poking out the back, but in some ways that, too, is a bit of a letdown. It's a 5-megapixel unit consisting of the same five-element, f/2.4 lens and stabilization processing wizardry found in the iPhone 4S. But, curiously, the bigger iPad takes a step down to a more lowly 5-megapixel sensor.

But, move past megapixels (as we encourage most digital shooters to do) and you'll find the image quality to be very high here. We found it easy to take pleasing photos with the new iPad, but we didn't see the drastic increase in shot-to-shot speed that we did on the 4S. That phone wowed us with its rapid-fire prowess, and indeed the iPad 2 is quite snappy moving from picture to picture. The new iPad is much slower. It's still plenty quick, on the order of two shots per second, but we'd estimate

the iPad 2 is roughly twice that fast.

Still, we'll take quality over quantity, and the new iPad's shots are far more pleasing to the eye.

Video has stepped up a good bit too, to 1080p from the previous 720, and again we saw a nice increase in quality over the former iPad. While we still hate the idea of taking pictures or videos with something packing a 9.7-inch display, if you must you will at least have great results now.



### Accessories

So width and height are the same as the iPad 2, but as we mentioned above thickness is now 0.6mm greater than before. That's but a sliver of a difference and difficult to notice unless you stack the two next to each other, but if you're dealing with a finely-crafted case made to exacting specifications that increase is more than enough to cause issues. Thankfully, most



cases aren't made to such high standards, so there's a very good chance your old sleeve will do just fine.

We tried a few different sleeves and loose cases and there was no issue with the majority of them. Some plastic-backed cases that clip on refused to hold on very securely, but for the most part this new iPad is backwards compatible. Indeed, Apple's own Smart Cover clips on to the side magnetically just like on the iPad 2. In fact all the other first-party iPad accessories should be perfectly compatible, thanks in large part to the continuation of the 40-pin dock connector. And, thanks to the hugely useful iOS version of iPhoto, the SD Card Reader and Camera Connector are of particular value now.

But, the best accessory for the iPad will likely prove to be the new Apple TV. This guy features a friendlier UI and, finally, 1080p support. It isn't the iOS-having, app-running update that we've been hoping for, but beaming 1080p content straight to your TV over AirPlay is about as easy as it gets and, for many,

worth the \$99 price of admission.



## Price, Options and Data Plans

The new iPad is priced exactly the same as the old iPad used to be. That is to say, a 16GB model starts at \$499. 32GB costs \$100 more and 64GB is another \$100 on top of that, for a range-topping price of \$699. Unfortunately, there's still no 128GB option, a shame given the size of the textbooks Apple is now hawking. More storage is a must for whatever the next new iPad turns out to be.

The 3G / LTE models, whether you choose AT&T or Verizon, will cost you \$130 more. So that's \$629, \$729 or \$829. Cheap? No, but those are at least off-contract prices. As before, data plans are all month-to-month, so no worries about signing away the next two years of your wireless freedom. You'll simply buy your data at the beginning of the month and next month, if you want more, you'll have to pay again.

On AT&T you're looking at 250MB for \$14.99 monthly, but on LTE we could

see blowing through that in a day. A more realistic 3GB will cost you \$30 while 5GB is \$50. AT&T does not offer tethering yet (though it intends to in the future), so if you want your slate to also be a portable hotspot *today* you'll need to go to Verizon. There you'll be paying \$20 for 1GB, \$30 for 2GB, \$50 for 5GB and \$80 for 10GB on the top end. If you opt to buy your iPad pre-activated through Verizon they'll also give you the option of paying \$10 for every GB over your allowance.



### Wrap-Up

With the new iPad, Apple has chosen to take small steps in many areas, making a logical upgrade on the camera, a modest improvement in graphics performance and the perfectly natural addition of LTE wireless. Other things have been left the same, like the overall size and form-factor, speed, the selection of capacities and, most importantly, the pricing. It's only with the display that Apple made a truly big step forward here over the iPad 2, and for many that's enough to make an upgrade worthwhile.

The new iPad doesn't do anything substantially better or particularly different than the iPad 2, offering the same rich world of content as before. But, it's the amazingly high quality window into that world the new iPad offers that is completely unmatched — for the moment. We have no doubt that others will be bringing similarly high-res offerings to market soon, but for now

the new iPad takes the cake. Is it worth a purchase if you still have the original iPad? Yes, absolutely. The iPad 2? That, dear readers, largely depends on how much disposable income you're swinging around, but if you have the means...

*Mat Smith, Richard Lai and Zach Honig contributed to this review.*

*Tim Stevens is Editor-in-chief at Engadget, a lifelong gamer, a wanna-be racer, and a born Vermonter.*

## BOTTOMLINE

### Apple iPad (2012)

\$499+

#### PROS

- Amazing display
- LTE Speeds
- Improved camera
- Comparable battery life with LTE

#### CONS

- No 128GB option
- Slightly larger and heavier

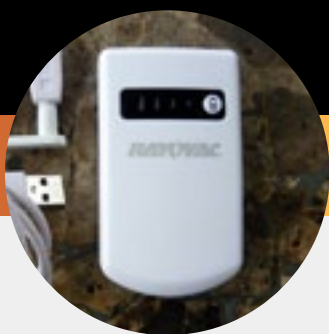
Apple's new iPad offers neither a massive improvement in performance nor functionality, but the new display alone makes it a great update.



# >> IN REAL LIFE

Welcome to IRL, an ongoing feature where we talk about the gadgets, apps and toys we're using in real life and take a second look at products that already got the formal review treatment.

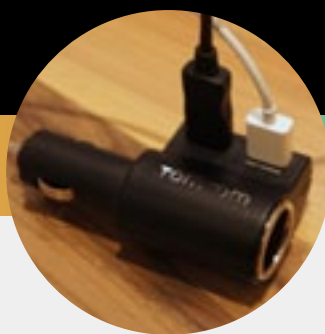
1.



2.



3.



## Rayovac Mobile Power Pack, a TomTom Car Charger and Cleaning a DSLR Sensor

BY ENGADGET STAFF

**This week's edition** of IRL is geekier than usual, because we all have to let our nerd flags fly sometime, and we figured now's as good a time as any. On tap we have James Trew and Andy Bowen talking about their favorite ways to charge gadgets on the go, while Darren Murph, a man after serious photographers' hearts, tells what happened when he took his beloved D3S in to have the sensor cleaned.

### TomTom High-Speed Multi Charger

Since I packed in the smokes a few years ago, the lighter socket in my car has remained largely vacant. Until semi-recently, that is. Like most folks around these parts I probably have more gadgets than I really need. That's typically not a problem, but sometimes — like on long journeys — feeding all those hungry devices becomes difficult.



TomTom clearly feels my pain. Essentially, that contraption you see there is an in-car 12V charger with two USB ports. To be fair, it's really the USB ports that I'm after, as they allow me to juice up my GPS while topping up my phone, tablet or whatever else I happened to bring along without bothering to check the charge. It also lets you run something else off the 12V in-car socket — perhaps some dedicated travel accessories, if you have them.

If you're going to be on the road for any amount of time, the added security of being able to power up your tech or run the Sat Nav for hours while charging

another is great, especially if you rely on connected apps to find points of interest, read TripAdvisor or just augment reality — as you do. — *James Trew*

### **Rayovac Mobile Power Pack**

I impulse-bought the Rayovac Mobile Power Pack not only because I'm a sucker for catchy rhymes, but because it was a mere 17 bucks. I'm not a worrier, but I do like being prepared — Boy Scouts can do that sort of thing to you — and keeping a charge on my iPhone 4S at all times is a must in my book. I'd been rummaging around for a decent battery pack for a while when this caught my eye

at the edge of the Wal-Mart checkout line. Although I'm a hardcore Energizer Bunny fan, I thought I'd give Rayovac a shot.

Before my serendipitous encounter, I had my eye on the Motorola 89442N Universal External Cell Phone Battery, a pack about the size of a phone with a bantam micro-

USB arm. I hadn't purchased it because it ran a whopping \$45 dollars brand new and I couldn't justify thirty more minutes of *Trolls N' Towers* per day for that price. The device contains a lithium battery pack that charges to the max in about three hours (my only complaint), giving your iPhone 4 another six hours of talk time. Having a single cable, it's enclosed with a micro-USB, mini-USB and Apple charging adapter that unfortunately doesn't support data transfers. So, it works with pretty much anything. I've charged my camera, iPad, iPhone 4S and Sony Bloggie with it many times, and I can't seem to notice any depletion in battery capacity. The Rayovac Mobile Power Pack is definitely full of mobile-charging-win in terms of versatility and budget. — *Andy Bowen*



### Getting a DSLR Sensor Cleaned

I struggled for well over a year with this. I knew that spots were creeping in on the sensor of my Nikon D3S, and each time my wife shot another beach-front wedding or we traveled to a place with gobs of salt in the air, I noticed it getting a wee bit worse. Hardly anyone outside of professionals would notice, but I noticed. And it bothered me. I read hundreds of horror stories from those trying to make things better — people attempted to use liquid solutions without any guidance, and ruined their sensors.


The debris on my sensor was so serious that no brush or air pump would fix it; I knew I needed liquid, and I knew I didn't trust myself to do it. I found a local Nikon repairman while





in Honolulu, and figured I'd let him have a crack at it. Fifty dollars out of my pocket and a few hours later, the spots were completely gone. But not all was perfectly well.

The liquid residue had left a few very minor smudges, which I had to go in myself and polish off with a sensor brush. All in all, it required a fair

amount of work, but it's worth it. Not seeing any stray specs in a gorgeous landscape shot is delightful; my only regret was not getting it done sooner. If you're considering it, get a professional to do it — the toughest part will be deciding on 24 to 48 hours in which you can actually afford to relinquish command of your rig. — *Darren Murph* 



THE HOST OF  
REVISION3'S TEKZILLA  
AND HD NATION  
TALKS ABOUT HIS  
DEPENDENCE ON THE  
IPHONE AND BEING  
AN OS AGNOSTIC.

# PATRICK NORTON

## Q&A

**What gadget do you depend on most?** My iPhone oozed into my life and took over like some kind of b-movie psycho roommate. It's replaced my camera, GPS, iPod and my "always in my bag" video camera. It brings the Internet everywhere. The Light app makes it a workable flashlight. It's got all the music for my car stereo and does my navigation, too. My son practices counting and reading on it when he's not nursing a serious *Cut The Rope* habit. I've used it to display manuals while I'm working on my truck, watch Netflix on the ferry and as a shot timer at the range. It's an OK phone, too!

**Which do you look back upon most fondly?** I wish I remembered the name of the broadband DSL modem that replaced my 56K dialup connection to the Internet. I have nothing but love for that box, especially after I attached it to my first WiFi router. Wireless internet rules.

I've always been a map geek so my first GPS device was a miraculous experience, even if you had to stuff it into a computer to power it and run software to make it do anything useful.

The sound from my first pair of Grado headphones!

**Which company does the most to push the industry?** I think Vizio did a lot to make HDTVs affordable for the masses. Google, Apple and Intel have impacted every corner of tech. Microsoft never gets much credit for innovation, but I think they're trying with Windows Phone and Windows 8, and they're such a target for other companies to beat.

**What is your operating system of choice?** I'm pretty agnostic, questions from Tekzilla's audience keep me playing around with 'em all. I've got OS X, Windows 7 and Windows 8 running on two machines in front of me as I type. I just put Fedora Linux with Amahi on a server and I keep puttering with Ubuntu and Puppy-Linux. I probably spend the most time in OS X, Revision3 is almost entirely an Apple shop.

**What are your favorite gadget names?** AimPoint, PowerShot, MacBook, iPhone, eBook, CompactFlash, Rebel, Kindle, CD, HDTV, AimPoint... BoreSnake is pretty good, too.

# If Google Docs goes down I'm in a world of hurt at the office.

**What are your least favorite?** iPod. As much as I love the product, I never quite got the name. I still think HD DVD is a lot more consumer friendly than Blu-ray. Blu-ray sounds like something Ming the Merciless would fire at Flash Gordon. HD DVD... it's like DVD, but better, right?

**Which app do you depend on most?**

ANSWER

**What traits do you most deplore in a smartphone?** Poor battery life, weak cell reception, screens that aren't bright enough to deal with sunlight, weak app selection, tiny buttons on the device or tiny keyboards on the screen, cheap build quality. Can I add carriers that suck? They can really ruin your experience with a smartphone.

**Which do you most admire?** Clean designs that don't fall apart or crud up easily. Speed. Battery life. Apps... lots and lots of apps... tools to find the best ones are a good idea, too. Ridiculously fast internet performance. A robust selection of accessories. Stability / fast bug fixes on the OS are critical at this point.

**What is your idea of the perfect device?** I'd love it if my iPhone 4s had less glass, more metal, about 3x the battery life, a bigger camera sensor and lens, an SD Card slot, 4G speed everywhere and the ability to morph between a 10 or 13-inch screen and something that fits in a pocket.

Basically, I want a smart phone that violates the laws of physics.

**What is your earliest gadget memory?** The pushbutton radio in my Dad's Buick Electra... not so much the push-buttons as listening to music with my Dad while he drove... "Where's the music come from, Dad?"

**What technological advancement do you most admire?** The Internet. Followed closely by GPS and the portable MP3 player! If we were talking outside the "Tech Industry" I'd have to give a big shout out to disinfectants, washing machines, internal combustion and the refrigerator.

**Which do you most despise?** Cell phones, at least when people talk on 'em in the movie theater or text while they're pretending to drive.

**What fault are you most tolerant of in a gadget?** Problems that can be fixed with a quick firmware or

software update.

**Which are you most intolerant of?** Products that just don't frackin' work out of the box, closely followed by shiny black surfaces that harvest fingerprints.


**When has your smartphone been of the most help?** Dialing 911. Checking prices. Avoiding traffic. Killing time while waiting at the DMV. Distracting my son when the restaurant is taking forever with dinner. I could go on for a while.

**What device do you covet most?** DigitalProjection makes some pretty amazing projectors... one of those and a Stewart Filmscreen would really perfect our home theater.

**If you could change one thing about your phone what would it be?** Faster internet in more places!

**What does being connected mean to you?** That being distracted from much more important tasks is now available almost everywhere!

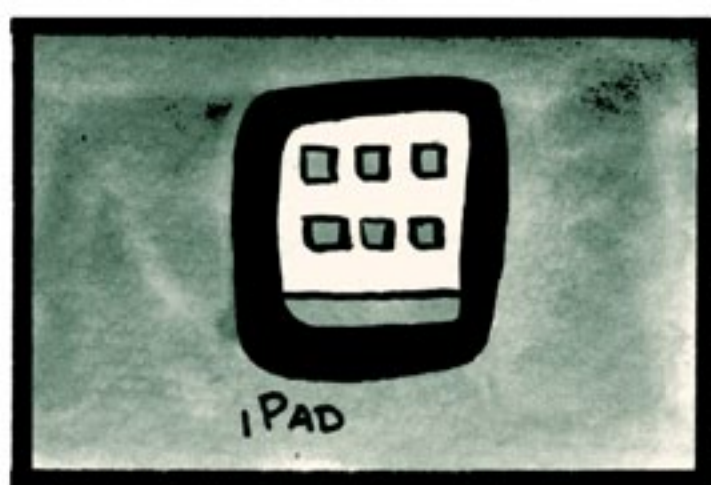
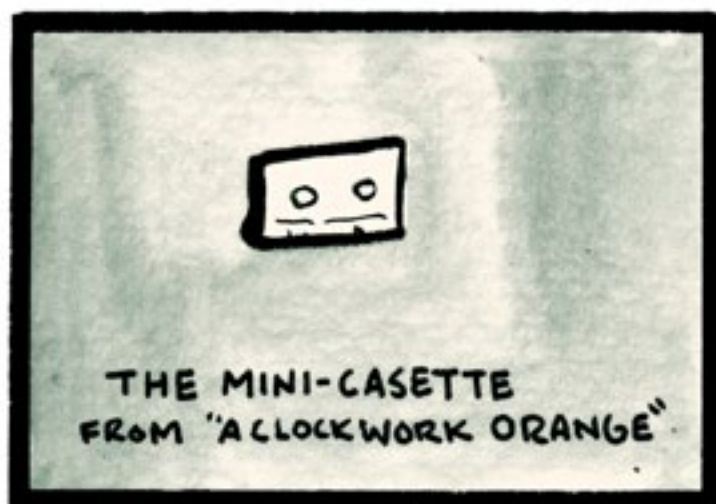
**When are you least likely to reply to an email?** When I'm asleep.

**When did you last disconnect?** Intentionally or accidentally? 

*Q&A : Patrick Norton*



## Movie Technology vs. its Real Life Equivalent



88

*The Last Word - Box Brown*



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**Designers**  
**Contributing Designers**

## AOL Mobile

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Eve Binder / Susana Soares / Will Lipman  
Aaron Martin / Candy Mayo / Davy Reynolds  
Brendan Dalton

**Product Manager**  
**Architects**

Luan Tran  
Scott Tury / Todd Brannam

**Developers**

Kyle Lu / Scott Tury / Mike Levine  
Ron Anderson / Terence Worley  
Chaitanya Muppa / Tejas Lagvankar  
Sudheer Agrawal / Jared Sheehan

**Tech Leadership**  
**QA**

Bob Ward / Larry Aasen  
Harry Bowen Jr. / Moncef Belyamani  
Basil Darwaza / Eileen Miller  
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Mandar Shinde / Alice Hawari



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IRL: Sony NEX-C3, Garmin Forerunner 110 and the Elgato Turbo.264 HD

3 HOURS AGO  
iPhone 5 to have 21Mbps HSPA+ data? China Unicom says so



30 MINS AGO

## Dell confirms XPS 14z will go on sale in the US in the 'coming weeks'

Remember that XPS 14z Dell teased at IFA? Yeah, well, it's arriving soon. As in, "the coming weeks" soon. The company just confirmed it's on the cusp of shipping here in the states, and while the outfit stopped short of giving a starting price, it's good and ready to talk specs. As we reported last month, it has the same industri...

By Dana Wollman September 29, 2011 12:35PM



54 MINS AGO

## iPhone 5 cases and realistic unibody dummy show off incredible slimness

While we're only five days away from finding out the true appearance of the next-generation iPhone, our good friends over at BENM.AT went ahead and crafted their very own unibody dummy using CAD drawings, CNC tools and a block of aluminum -- seriously, that's how they roll! Granted, this work's only based on...

By Richard Lai September 29, 2011 12:13PM



1 HOUR AGO

## Kobo's Vox Android tablet appears online briefly, gets Canadian release date and pricing

A day after another little-known e-reader manufacturer announced a tablet, a new Android slate from Kobo made a brief online appearance on Future Shop's site, only to be quickly taken down. According to the Canadian retailer, the FCC-approved tablet will offer up a 7-inch display with a 1024 x 600 resolution, WiF...

By Brian Heater September 29, 2011 11:53AM



## Iceland gets a data center to call its own, still believes in fairies

You say Iceland, we immediately think Eyjafjallajökull -- and no, we haven't had a narcoleptic collapse upon these very keys. It's been over a year since that volcano swept the headlines and interrupted air travel, providing outsiders with a skewed

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